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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/582,881

06/14/2006

Koichi Shibayama

MIY-0213

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07/18/2008

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EXAMINER

LACLAIR, DARCY D

ART UNIT

PAPER NUMBER

4171

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/582,881	<b>Applicant(s)</b> SHIBAYAMA ET AL.	
	<b>Examiner</b> Darcy D. LaClair	<b>Art Unit</b> 4171	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/14/06</u> .   | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-7 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 2 of copending Application No. 10/433,956. (Alone or Alternately in view of Yonezawa et al. (WO 02/046313)).

3. The instant application claims a thermosetting resin composition, a material which is the resin, and a film composed of the material, which contain 100 parts by weight of a thermosetting resin, which is an epoxy resin, and 0.1 to 100 parts by weight of an inorganic compound, which is a laminar silicate, dispersed in the resin.

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Furthermore, the laminar silicate must be under 2  $\mu\text{m}$  and maintain 75% of its shape after curing.

4. The copending application '956 requires a material which comprises 100 parts by weight of an epoxy resin, and 1 to 50 parts by weight of a layered silicate. This overlaps a significant portion of the range claimed by the instant application. Layered and laminar silicate two names for the same thing. The silicate has an average interlaminar distance of 3 to 5 nm, and 5 or less layers. This suggests that the particle size of the silicate used would be small, on the same order of the instant application. It would have been obvious to optimize the silicate to achieve a good material, and that would lead one of ordinary skill in the art to laminar or layered silicate particles of the same size. Additionally, the laminar silicate would provide structural integrity to the material, based on its shape and behavior. This would cause the material to maintain its shape during curing. The copending application also claims the material which is for insulating substrate. This would be easy to use as a prepared layer or film, or to apply as a film, and it would be obvious to use the composition in this manner.

5. Alternatively, while the copending claims fail to specifically require a particle size or structural integrity.

6. However, Yonezawa teaches a laminar or layered silicate which meets both the instant application's size requirement ( $\text{¶}$ 82), and the copending application's interlaminar distance requirement ( $\text{¶}$ 100). This indicates that a single material both requirements of both applications, is available, and known.

7. It would have been obvious to use this material in the copending invention to achieve the benefits described by Yonezawa. These benefits include excellent dimensional stability (§10), because the layered silicate has a high shape anisotropic effect. (§81) Yonezawa teaches a highly similar composition, and exemplifies sheets (or films). (Ex. 20, 21) Based on the similarity of the composition taught in the copending application, it would be obvious to have used it to prepare films, as required in the instant application.

This is a provisional obviousness-type double patenting rejection.

### ***Specification***

1. The disclosure is objected to because of the following informalities: The disclosure contains multiple instances of poor grammatical usage. An example of this is in paragraph 10, where the phrase “which enables to obtain” is used. Please review the grammar and language use.
2. The disclosure contains references to methods (1) through (6), which are not clearly defined. See paragraph 35 which indicates that method (1) and (6) are to be described later, and paragraph 36 which indicates that the above method of chemical modification (1) is also referred to by a different descriptor. With no intervening paragraph between “later” and “above, it appears that the specification may have been rearranged, making these references confusing. In addition, the frequent use of “above-

mentioned" terminology makes deciphering the specification difficult, especially where it is not immediately apparent to what the "above" refers.

3. The disclosure refers at several instances to a property becoming "proper." An example of this is in paragraph 59, where the disclosure indicates "a distance between crystals of the laminar silicate in flake form becomes proper and effects of improvement ...." Does "proper" refer to the "preferable" qualities indicated earlier, or a trait well known in the art, or some other feature?

### ***Claim Objections***

4. Claims 5 and 8-9 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. A material characterized as being composed by using the thermoplastic resin is essentially claiming the thermoplastic resin material. This is already accomplished in the claims from which 5 and 8-9 depend.

5. Claims 6 and 8-11 are objected to because of the following informalities:  
The phrase "is composed by using" is verbose. It is suggested that applicant use conventional claim language.

6. Claim 2 is objected to because they state that "said inorganic compound is an inorganic compound containing silicon and oxygen as a constituent element." It should read "as constituent elements" if two elements are included.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 1 -11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claim 1 recites an inorganic compound with a particle diameter of 2  $\mu\text{m}$  or less, and it is further defined as a laminar silicate in claim 3. A laminar particle, or platelet, is not spherical. It is a layered structure with a high aspect ratio, indicating that it is of varying lengths in varying dimensions. It is clear that the particle would have no diameter, per se. It is not clear how this "diameter" would be calculated, or alternatively, whether this dimension refers instead to one particular dimension of the laminar particle. It is not clear what applicant intends to use in their invention.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(f) he did not himself invent the subject matter sought to be patented.

8. Claims 1-11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yonezawa et al. (WO 02/046312, later filed as EP 1 350 815 A1 and US 2004/0053061, utilized here as translations. Paragraph indications are based on the US document.)

9. Claim 1 requires a composition of 100 parts by weight of a thermosetting resin and 0.1 to 100 parts by weight of an inorganic compound with a diameter of 2  $\mu\text{m}$  or less, which will retain 75% of its shape during molding. Yonezawa teaches a material which is 100 parts by weight of a resin and 0.1 to 100 parts by weight of a layered silicate. (abs) Yonezawa teaches that the material comprises a thermoplastic and/OR (emphasis added) a thermosetting resin. (¶22) Yonezawa later gives a highly detailed, highly extensive recitation of examples of the thermosetting resin. (¶42-55) The examples of thermosetting resins, in particular, epoxy resins, are virtually identical, right down to the groupings, with those disclosed by applicant. (¶43-55) Yonezawa additionally teaches that the layered silicate should have a preferable particle diameter of 0.05 to 2  $\mu\text{m}$ . (¶83) In particular, this details that particle may have any shape, and the average length of the layered silicate is preferably 0.05 to 2  $\mu\text{m}$ , and the thickness is

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preferably 0.001 to 1  $\mu\text{m}$ , which would give an average size of under 2  $\mu\text{m}$ . In addition, the laminar silicates taught by Yonezawa are almost identical down to their treatment methods, (§80) to those taught by applicant, and the filler is important in maintaining structural integrity. (§81) It is therefore almost assured that the properties would be the same, and the deformation during curing would be in keeping with the deformation of applicant's invention, and be less than 75%.

10. Claim 2 requires that the inorganic compound contains silicon and oxygen "as a constituent element." (sic) Yonezawa teaches that layered silicates include smectite clay such as montmorillonite, saponite, hectorite, beidellite, and stevensite, as well as swelling mica. (§80) These are consistent with the silicas presented by applicant and these include oxygen and silicon as constituents.

11. Claim 3 requires a laminar silicate. Yonezawa teaches a layered silicate. (§80)

12. Claims 4 and 7 require that the composition contains an epoxy resin. Yonezawa gives a highly detailed, highly extensive recitation of examples of the thermosetting resin. (§42-55) Epoxy resins are among the preferred options, and the examples of thermosetting resins, in particular, epoxy resins, are virtually identical, right down to the groupings, with those disclosed by applicant. (§43-55)

13. Claim 5 and 8-9 require a material for substrates, characterized in that the material is composed of the composition of earlier claims 1-4. A material which is characterized only in that it is composed of a composition fails to further limit the invention. These claims are therefore treated as discussed above.

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14. Claims 6, and 10-11 require a film formed from the thermoplastic resin taught in prior claims. Yonezawa teaches that the material may be used in a variety of applications, including layered substrates, laminates, and several types of films. (§134)

15. Claims 1-11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Shibayama et al. (JP 2003/313345, machine translation provided)

16. For Claim 1: Shibayama teaches a 100 weight section thermosetting resin, and 0.1 to 100 weight section of sheet silicate. Sheet silicate is analogous to applicant's laminar silicate. (§15) Shibayama teaches that the silicate should have a preferred average length of 0.01 to 2 micrometers (§64) Yonezawa later gives a highly detailed, highly extensive recitation of examples of the thermosetting resin. (§18-31) The examples of thermosetting resins, in particular, epoxy resins, are virtually identical, right down to the groupings, with those disclosed by applicant. (§19-31) Further, Yonezawa discloses that the sheet silicates are preferably the same compounds, of the same shape and size, with the same treatments favored by applicant (§64, 65-66, 68-82) Because the filler is important in maintaining structural integrity, (§66) it is almost assured that the properties would be the same, and the deformation during curing would be in keeping with the deformation of applicant's invention, and be less than 75%.

17. Claim 2 requires that the inorganic compound contains silicon and oxygen "as a constituent element." (sic) Shibayama teaches that layered silicates include smectite clay such as montmorillonite, saponite, hectorite, beidellite, and stevensite, as well as

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swelling mica. (¶64) These are consistent with the silicas presented by applicant and these include oxygen and silicon as constituents.

18. Claim 3 requires a laminar silicate. Shibayama teaches a “sheet” silicate, which may mean a stratified silicate material. (¶64) This is alternate terminology for a laminar or layered silicate.

19. Claims 4 and 7 require that the composition contains an epoxy resin. Shibayama gives a highly detailed, highly extensive recitation of examples of the thermosetting resin. (¶16-63) Epoxy resins are among the preferred options, and the epoxies constitute the first, and most extensive teaching. The examples of the epoxy resins are virtually identical, right down to the groupings, with those disclosed by applicant. (¶19-31)

20. Claim 5 and 8-9 require a material for substrates, characterized in that the material is composed of the composition of earlier claims 1-4. A material which is characterized only in that it is composed of a composition fails to further limit the invention. These claims are therefore treated as discussed above.

21. Claims 6, and 10-11 require a film formed from the thermoplastic resin taught in prior claims. Shibayama teaches that the material may be used in a variety of applications, including a laminate sheet, a layer of a multilayer substrate, and several types of films.(¶110) This is consistent with forming a film, sheet, or layer, which is alternate terminology for the same structure.

22. Claims 1-16 are rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter.

This rejection is based on the work presented by Yonezawa et al. (WO 02/046312, EP 1 350 815 A1, US 2004/0053061) and Shibayama et al. (JP 2003/313345). These documents, utilized here as prior art, share striking similarities both in inventive concept and in the content, wording, and organization of the specifications. Despite these similarities, the inventorship is not shared in common between these works.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Thursday 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 4171

Darcy D. LaClair  
Examiner  
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/DDL/